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SERIES I No. 35



OFFICIAL GAZETTE

GOVERNMENT OF GOA, DAMAN AND DIU

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Labour and Information Department

Notification

LC/23/13A-9/72

The following draft rules which the Government of Goa, Daman & Diu proposes to make in exercise of the powers conferred by section 29 of the Indian Boilers Act, 1923 (Act 5 of 1923) and all other powers enabling it in that behalf are hereby published as required by Sub-section (1) of section 31 of the said Act and notice is hereby given that the draft of the said rules will be taken into consideration on the expiry of the one month from the date of publication of the notification.

2. Any objections and suggestions which may be received by the Secretary to the Government of Goa, Daman & Diu, Labour and Information Department, Secretariat, Panaji, from any person with respect to the said draft rules before the expiry of the aforesaid period will be considered by the Government.

DRAFT RULES

In exercise of the powers conferred by section 29 of the Indian Boilers' Act, 1923 (Act 5 of 1923) and all other powers enabling it in that behalf the Government of Goa, Daman and Diu hereby makes the following rules, namely:—

I. Preliminary

1. **Short title and extent.**— (1) These rules may be called the Goa, Daman and Diu Boiler Rules, 1973.

(2) They extend to the whole of the Union Territory of Goa, Daman & Diu.

2. **Definitions.**— In these rules unless the context requires otherwise—

(a) "the Act" means the Indian Boilers Act, 1923;

(b) "Appellate authority" means an appellate authority constituted by Rule 62;

(c) "Board" means the Board of examiners constituted under rule 73;

(d) "Section" means a section of the said Act;

(e) "Regulation" means a regulation framed by the Board under section 28;

(f) "Rule" means a rule framed under the Indian Boilers Act, 1923 by the Government of Goa, Daman & Diu, under section 29;

(g) "Commissioner" means the Labour Commissioner, Goa, Daman and Diu or any deputy appointed by him under any rule providing the appointment of a deputy;

(h) "Govt." means the Government of Goa, Daman & Diu;

(i) Every reference in these rules to a boiler or boilers shall be deemed to include also a reference to an economiser, or economisers respectively;

(j) "Inspecting Authority" and "Inspecting Officer" shall have the respective meanings assigned in the Indian Boilers Regulations, 1950.

3. Payment of fees.— All fees payable under the Act shall be deposited by the payer in a Government Treasury in the Union territory of Goa, Daman and Diu under the Head of Account: "XXXII Miscellaneous, Social and Developmental Organisation. Receipts under Boiler inspection".

Applications under sections 7 and 8 to which the treasury receipt is affixed shall be deemed to be accompanied by the prescribed fees.

All fees, costs and penalties levied under the Act shall be disposed of in such manner as the Government from time to time direct.

4. Location of offices.— The location and charge of the offices for the undermentioned areas shall be as follows:—

1. For the whole of Union Territory of Goa, Daman and Diu.	Office of the Labour Commissioner, Panaji, Goa.
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II. Duties of the Chief Inspector

5. Administrative control.— The Chief Inspector shall work under the administrative control of the Commissioner and shall submit to him—

(a) an Annual Report on the Administration of the act;

(b) such other reports and returns as may be called by the Commissioner.

6. Duty of general control.— The Chief Inspector is vested with all the powers of an Inspector under the Act. His main duty, however, consists in supervising and controlling the work of the Inspectors and he should only actually inspect or examine boilers in exceptional cases, or where he considers

that the work of an Inspector requires a personal check:

7. Specific duties of Chief Inspector. — The Chief Inspector shall —

- (a) Personally check the registration particulars and calculations submitted by Inspectors for all boilers inspected for registration as prescribed in Chapter IX of the Regulations and enter under his own signature the approved working pressure and all orders required by section 7;
- (b) enter under his own signature any subsequent entries required in the registration book;
- (c) obtain from the state of registry the registration book of any boiler the transfer of which is reported under section 6(b);
- (d) fix the area under the control of each Inspector;
- (e) approve the programmes of all the Inspectors subordinate to him with due regard to the convenience of owners generally;
- (f) examine and countersign the Inspectors' Memorandum of Inspection Book of each boiler after each inspection;
- (g) examine and pass orders on the diaries and returns of Inspectors;
- (h) pass orders in all cases in which an Inspector proposes to increase or reduce the pressure allowed for any boiler under section 8, or to revoke, cancel or refuse to renew the certificate of a boiler under section 11, or to order important repairs, structural alterations, or renewals in a boiler under section 8;
- (i) pass orders in all case in which it is reported that after due notice the boiler has not been properly prepared for inspection;
- (j) decide all appeals against the order of an Inspector under section 19;
- (k) sanction prosecutions under the Act;
- (l) inquire into serious accidents to boilers.

8. Instruction to owners. — It shall be the duty of the Chief Inspector to advise owners as regards the maintenance, working and cleaning of boilers; he should issue a set of instructions on the lines indicated in Form C appended to these rules. These instructions should be hung up in each boiler house.

9. Registers to be kept. — The Chief Inspector shall keep in his office —

- (a) a register in Form A of all boilers registered in the Union Territory or the registry of which has been transferred from another State;
- (b) the Registration Book and Memorandum of Inspection Book of all boilers borne on his register;
- (c) a register of appeals;
- (d) a register of accidents;
- (e) a register of registration and Inspection fees received.

10. Control of bills. — The Chief Inspector shall be the controlling or countersigning authority of all contingent bill and of travelling allowance bills of officers subordinate to him.

III. Inspecting Staff

11. Appointment of inspectors and general duties of inspectors. — (1) No person shall be appointed as Inspector for the purposes of the Act, unless he possesses the qualifications as prescribed for such Inspectors by any general or special order of the Government of Goa, Daman and Diu at the time of his appointment.

(2) The main duties of the Inspector, as laid down in the Act, are the inspection and examination of boilers and steam-pipes. Inspections shall be carried out in strict accordance with Chapter IX of the Regulations and Chapters IV and V of these rules.

12. Inspectors to see that boilers are worked according to Law. — In addition to the inspection and examination of boilers it is the duty of Inspectors to search for unregistered or uncertificated boilers within their areas, and to see that certificated boilers are worked in accordance with the terms of their certificates, and with any regulation or rule under the Act for their safe working.

13. Inspectors to advise owners. — At the time of inspection, Inspectors should advise the owner and the person in charge of the boiler of the management and upkeep of the boiler with special reference to the amount of cleaning required in view of the quality of water use.

14. Specific duties. — (1) The Inspectors shall also carry out the following duties in addition:

- (a) prepare a programme of inspections with regard to the convenience of owners generally in the most suitable order of places to save time and expenditure in cross journeys and submit it at such periods as may be prescribed at least 14 days before the first date fixed in the programme to the Chief Inspector for approval to enable 10 days' notice required under sections 7 and 8 to be given to the owner;
- (b) maintain a Memorandum of Inspection Book for each boiler under their charge and submit it to the Chief Inspector for examination and countersignature after each inspection;
- (c) keep diary for weekly submission to the Chief Inspector showing places visited, boilers registered or inspected, with fees paid thereon, variations from the programme and any other important particulars;
- (d) receive applications for registration or inspection under section 7 or 8, proposals for repairs, alterations, or renewals under sections 12 and 13, and reports of accident under section 18;
- (e) inquire into accidents to boilers and steam-pipes and report to the Chief Inspector;
- (f) report to the Chief Inspector cases of unreported accidents discovered at the time of inspection;
- (g) submit for the orders of the Chief Inspector —
 - (i) the Memorandum of Inspection Books of all boilers proposed for registration under section 7;
 - (ii) proposals for increasing or decreasing the pressure of a boiler after inspection under section 8;

- (iii) proposals for necessary repairs, structural alterations or renewals to a boiler under section 8 or 12;
- (iv) proposals for revoking, cancelling or refusing to renew a certificate under section 11 or 8;
- (v) report when boilers have not been properly prepared for inspection under section 14;
- (vi) proposals for prosecution under the Act.

15. Inspections at special times.—No examination of a boiler shall be made by an Inspector for the purpose of registering or issuing a certificate for a boiler on a Sunday or gazetted public holiday or between the hours of sunset and sunrise without the specific orders of the Chief Inspector in each case. In such case an extra fee equal to the usual registration or inspection fee for the boiler may be charged and half of the extra fee may be paid to the Inspector.

16. Attendance during hearing of appeals.—Under orders of the Chief Inspector, Inspectors shall attend during the hearing of appeals with regard to boilers under their charge before the Chief Inspector or the Appellate Authority.

17. Registers to be kept.—Every Inspector in charge of an office shall keep—

- (a) a register in Form A of all registered boilers situated within his jurisdiction;
- (b) a register of accidents;
- (c) a register of registrations and inspection fees received.

IV. Administrative Instructions for Registration

18. Importance of registration.—Technical regulations for the registration of boilers and the scale of fees for registration are prescribed in Chapter IX of the Regulations. The details of measurements recorded at the time of registration constitute a permanent record for the boiler and determine the original pressure at which the boiler is allowed to work. It is accordingly essential that the work should be done with the greatest care and precision.

19. Receipt of applications.—Applications for registration shall be made under section 7 (1) either to the Chief Inspector, or to the Inspector of the local area in which the boiler is situated and shall be accompanied under rule 3 by a receipt for the prescribed fee. No application shall be accepted without the receipt. No boiler shall be registered if on measurement the fee is found to be deficient, until the deficit has been paid. Any excess payment will be refunded at the time of registration.

20. Necessity of avoiding delay.—It is essential that no delay should occur in registration. In local area the measurements under section 7 (3) should ordinarily be completed and the report submitted to the Chief Inspector within 7 days of the receipt of the application; in no case should the interval exceed 30 days. The Chief Inspector should issue his orders under section 7 (4) without delay.

21. Register of registered boilers.—The Chief Inspector shall maintain a Register of registered boilers in serial order in Form A in two parts; in

Part I (boilers originally registered in Union Territory of Goa, Daman & Diu) the registered number of a boiler shall be the one immediately following the last serial number in the Register. Gap number due to boilers being broken up or transferred to another State or Union Territories shall not be filled up. In part II (boilers originally registered in other States or Union Territories) entries shall be made as prescribed in Rule 23. Inspectors in charge of an office shall keep a similar Register for all boilers within their jurisdiction.

22. Procedure on transfer of a Boiler.—Whenever a boiler is transferred from another State or Union Territory into the Union Territory of Goa, Daman & Diu the owner shall, under section 6 (b), apply to the Chief Inspector for the registration of the transfer; the boiler cannot be used until registration has been effected. The Chief Inspector shall then obtain from the State or the Union Territory from which the boiler was transferred the Registration Book and Memorandum of Inspection Book of the Boiler. No fee shall be charged for recording transfers.

23. Entry of the transferred boiler in register.—On receipt of the Registration and Memorandum of Inspection Books, the Chief Inspector shall enter the boiler under its original number in Part II of his Register, and shall instruct the Inspector of the local area in which the boiler is situated to enter it similarly in his Register. The Registration Book and the Memorandum of Inspection Book shall be kept in the Chief Inspector's office.

24. Note of transferred and dismantled boilers.—Whenever a boiler has been transferred to another State or Union territory or broken up the fact shall be noted in the Register. In the case of a boiler that has been permanently dismantled the Registration Book and the Memorandum of Inspection Book shall be destroyed.

V. Administrative Instructions for Inspection

25. Procedure at inspections.—Internal Inspection—Detailed instructions for the inspection of boilers are contained in Chapter IX of the Regulations. The following general procedure at inspection should be observed:

At a thorough inspection of a boiler the Inspector should wherever the size and construction of the boiler permit, go inside it and make a thorough inspection of all its internal parts. But before doing so he should satisfy himself that proper provision has been made for disconnection from any other boiler under steam.

Should he find that proper provision for disconnection has not been made or that the boiler has not been properly cleaned or scaled or that it is unreasonably hot he should decline to proceed with the inspection and should report the facts to the Chief Inspector for orders under section 14(2). When a boiler is of such a size or its construction is such that the Inspector cannot go inside it there must be sufficient sight holes or hand holes provided to enable him to see the principal internal parts. If any important part of a boiler is so constructed that the Inspector cannot examine it he should report the facts to the Chief Inspector for orders.

26. External inspection.—Boilers must be examined externally as well as internally; particular attention should be paid to the external parts of the boilers where in contact with seating blocks and brick work, especially when the situation is damp. Having regard to any serious defects discovered, Inspectors should take care, in order to ensure proper inspection, that boilers, of which the whole of the outside cannot be readily examined, are cleared whenever they consider it necessary of any concealing covering, supports or fittings.

Saddle tanks and engine fittings of locomotive type boilers should be removed for inspection of the parts underneath at the first inspection and at any reasonable period afterwards if the Inspector cannot satisfy himself. If the owners in any special case have any good reasons for not wishing to clear covered parts, the case should be submitted to the Chief Inspector for orders. The Inspector must keep in mind that he is not to certify as efficient any boiler regarding the condition of which he cannot thoroughly satisfy himself.

27. Casual working inspection.—At the inspection of one of a battery of boilers the Inspector should take the opportunity of examining the other boilers under steam with special reference to the water gauges, pressure gauges and safety valves.

28. Proposals for reduction of pressure.—When the Inspector decides that a boiler in one or more of its parts is no longer fit for the pressure approved for it he should, without delay, report his proposals for reducing the pressure to the Chief Inspector and at the same time submit his calculations for wasted parts for check and approval of pressure. With regard to pitting and wasting of shell plates the Inspector must bear in mind that shell plates ordinarily are considerably stronger in the body of the plate, owing to being unpierced, than at the seams and consequently may become reduced in thickness to an appreciable extent in the body of the plate i.e. elsewhere than at the seams, and still be stronger than the seams.

29. Repairs to boilers.—Under section 12 of the Act the sanction of the Chief Inspector to all repairs proposed for boilers must be obtained beforehand.

A few water tubes or smoke tubes, however, may in an emergency be renewed pending the sanction of the Chief Inspector but all such cases must be reported immediately to the Chief Inspector who may, if he deems fit, notify his sanction to the owner without verification of the renewals by an Inspector.

Generally in repairing boilers the object to be obtained is to make up for damage or wastage by suitable compensation, either by renewal or repair of the part affected. Covering patches applied with the object of hiding defects are a source of danger and must not be passed.

Welding by electric and oxy-acetylene processes may be employed in the repair of boilers, but, as the efficiency of the welding depends largely on the skill and care of the operator each case will have to be decided on its merits.

Proper attention must be paid to the annealing of welded parts. An Inspector should, wherever possible, be present during some part at least, of the welding operations.

Extensive repairs such as renewal of furnaces, and plates, parts of shell, fire-boxes grinders, etc. should be supervised, so far as his other duties permit, by the Inspector and at such time when fire-boxes and smoke tubes of locomotive type boilers are withdrawn, advantage of the opportunity should be taken to inspect the internal parts otherwise inaccessible to close inspection.

Repairs to boilers are prescribed in Chapter IX, Regulation 392 of the Regulations.

30. Entries in Memorandum of Inspection Book.—An Inspector shall, as soon as convenient after an inspection, make the necessary entries in the Memorandum of Inspection Book for the boiler and submit the book to the Chief Inspector. Care should be taken to preserve the books and to keep them clean. Inspection notes should briefly state to what extent boilers were cleared of brick-work, lagging or concealing parts; the general condition of the boiler; parts requiring attention or repair and if special preparation is required at the next inspection.

Inspectors should also note in the Memorandum of Inspection Books all casual visits, inspections of steam pipes, visits for inspection of repairs, inquiry into accidents, etc., and so provide a useful record of the history of the boiler for the subsequent inspections.

In making inspections it is important that the Inspector should pay particular attention to entries made in the Memorandum of Inspection Book at previous inspections.

31. Entries in certificates.—In addition to the entries required to be made under Regulation 389 in a certificate for a boiler the Inspector should state in the remarks column his requirements, if any, with regard to hydraulic test, removal of lagging, brick-work or other concealing part for the next inspection to enable the owner to have the same properly prepared at that time. He should also state in the same place his requirements regarding the repair or removal of any part that may be considered fit only for the period of the certificate.

In the repairs column should be entered the year of repair and description of repair effected. Only important repairs should be noted.

His remarks should be brief. In the absence of remarks on the condition of boiler, the boiler will be considered to be in good condition.

32. Engraving of registry number.—Paper slips of the proper size bearing the registry number allotted for a boiler will be supplied by the Chief Inspector. The slip should be pasted on the part of the boiler pointed out by the Inspector and the device traced through with a cutting tool. The engraving should then be completed by the removal to the prescribed depth of the metal between the traced lines.

33. Arranging for inspections.—In arranging for inspection particular attention should be paid to the provisions of rule 14(a). The notice required by section 7(2) and 8(4) shall be sent in Form B. If a hydraulic test is necessary in addition to the ordinary inspection ample notice must be given to the owner.

34. Issue of certificates and provisional orders.—In cases in which the Inspector is empowered to issue a certificate under section 8 without further reference, the certificate should ordinarily be issued within 48 hours of the completion of the inspection. Where he proposes to issue a provisional order, the Inspector must satisfy himself that the boiler is fit to be worked at the maximum pressure and for the period entered in the provisional order. The fact of issue of a provisional order must be reported to the Chief Inspector.

35. Provisional orders to be issued after hydraulic tests.—Provisional orders should be issued in every case of registration after hydraulic test of boiler if the Inspector is satisfied.

The steam test may be witnessed at any convenient time within the period of the provisional order after which, if test is satisfactory, the certificate under section 7(6) is to be issued.

36. Forms of provisional orders and certificates.—Provisional orders and certificates are prescribed in Forms V and VI respectively of the Regulation.

The period specified in any provisional order or certificate shall begin on the day following that on which the enabling thorough inspection or hydraulic test is made. Where a certificate supercedes a provisional order during the period of its currency, the period of the certificate shall be retrospective and shall begin from the same time as that of the provisional order.

37. Duplicate certificates.—A duplicate of any certificate granted under section 7 or section 8 which is at the time in force shall be granted by the Chief Inspector on the application of the owner of the boiler if the Chief Inspector is satisfied that the duplicate is required for a bonafide purpose and the fee prescribed under Rule 44 is paid.

38. Fees for inspection.—Fees for inspection shall be calculated on the basis of boiler rating, as prescribed in Chapter IX, Regulation 384 of the Regulations. The following fees are prescribed:

Registration fees.—Fees for registration and first inspection of boilers are prescribed in Regulation 385 and 21(d) of the Regulations.

Inspection fees.—Fees for ordinary inspection of boiler shall be levied in accordance with the following scale:—

	Rs.
For boiler rating not exceeding 9.3 sq. metres	70/-
For boiler rating exceeding 9.3 sq. metres but not exceeding 27.9 sq. metres	80/-
For boiler rating exceeding 27.9 sq. metres but not exceeding 46.6 sq. metres	90/-
For boilers rating exceeding 45.9 sq. metres but not exceeding 65.1 sq. metres	105/-
For boilers rating exceeding 65.1 sq. metres but not exceeding 83.7 sq. metres	125/-
For boilers rating exceeding 83.7 sq. metres but not exceeding 102.3 sq. metres	145/-

For boilers rating exceeding 102.3 sq. metres but not exceeding 186 sq. metres	165/-
For boilers rating exceeding 186 sq. metres but not exceeding 372 sq. metres	190/-
For boilers rating exceeding 372 sq. metres but not exceeding 558 sq. metres	220/-
For boilers rating exceeding 558 sq. metres but not exceeding 774 sq. metres	250/-
For boilers rating exceeding 774 sq. metres but not exceeding 930 sq. metres	280/-
For boilers rating exceeding 930 sq. metres but not exceeding 1116 sq. metres	320/-
For boilers rating exceeding 1116 sq. metres but not exceeding 1,302 sq. metres	360/-
For boilers rating exceeding 1,302 sq. metres but not exceeding 1,488 sq. metres	400/-
For boilers rating exceeding 1,488 sq. metres but not exceeding 1,674 sq. metres	450/-
For boilers rating exceeding 1,674 sq. metres but not exceeding 1,860 sq. metres	500/-
For boilers rating exceeding 1,860 sq. metres but not exceeding 2,046 sq. metres	550/-
For boilers rating exceeding 2,046 sq. metres but not exceeding 2,232 sq. metres	600/-
For boilers rating exceeding 2,232 sq. metres but not exceeding 2,418 sq. metres	650/-
For boilers rating exceeding 2,418 sq. metres but not exceeding 2,604 sq. metres	700/-
For boilers rating exceeding 2,604 sq. metres but not exceeding 2,790 sq. metres	750/-

Above 2,790 square metres for every 186 sq. metres or part thereof an additional fee of Rs. 20/- shall be charged.

Fees for ordinary inspection of a miniature boiler shall be Rs. 30/-.

Provided that when any owner is willing to accept a renewed certificate for less than twelve months in order to approximate the date of annual inspection to the date on which other boilers in the locality are inspected, a certificate for such period less than twelve months, as may be necessary for such approximation of dates, may be granted at a reduced fee to be calculated at one-twelfth of the ordinary fee for each full month, portion of a month not being reckoned.

39. Fee to cover inspection and tests.—A fee paid for the inspection of a boiler shall cover tho-

rough inspection, hydraulic test and steam test where such are necessary, subject to the provisions of section 14(2).

40. Second Fee in Default.—A second fee will be leviable for reinspection in any case where the inspection of a boiler is begun, but owing to the fault of neglect of the owner or person in charge, is not completed within a period of six months from the date of commencement of Inspection.

41. Sanction of Chief Inspector to second fee.—No extra fee shall be levied except with the sanction of the Chief Inspector.

42. Special fee for inspections out of season.—For any inspection of a boiler situated at a place which is visited by an Inspector one or more times in a year for the purpose of inspecting boilers, if an owner or person in charge of a boiler fails to avail himself of the services of the Inspector during the usual period for visiting the district and applies for inspection at a time which would necessitate a special journey the owner or person in addition to the registration or inspection fee, pay such sum into the Government Treasury to cover the rail, conveyance and travelling allowance charges of the Inspector from the nearest headquarters and of any class IV servant accompanying him as the Chief Inspector may determine.

43. Fee for copy of Registration Book.—The fee for copy of Registration Book, excluding inspection notes and calculations shall be ten rupees.

44. Duplicate certificate fees.—Fees for duplicate certificate under rule 37:

For each—Rs. 5/-.

45. Refund of Fees.—Fees paid in excess and fees paid for an inspection which for any reason not due to any fault or omission of the owner or person in charge of the boiler has not been made, shall be refunded if a refund is applied for within one year from the date of payment.

VI. Accidents

46. Investigation of accidents.—On the receipt of a report of an accident to a boiler or steampipe under section 18, the inspector should, with the least possible delay, proceed to the place to investigate the accident. If the report is received by the Chief Inspector, he should forward it at once to the Inspector within whose jurisdiction the accident has occurred for necessary action.

47. Procedure during inquiry.—The Inspector at his inquiry shall make a careful examination of the damaged parts, and shall take such measurements and make such sketches for the purpose of his report, as he may deem necessary. He shall inquire into the circumstances attending the accident and note the time of its occurrence, its nature and extent the injury caused to persons and the damage done to property. The report should be in the style of the Reports of Preliminary Enquiries under the British Boiler Explosions Act, 1882 and 1890.

48. Power to hold inquiry in writing.—Inspectors are authorised to take the written statements

of witnesses and all persons immediately concerned with the accident. In order to comply with the provisions of section 18(2) the Inspector should present to the owner or person in-charge of the boiler a series of written questions on all points that are material to the enquiry.

49. Use of boiler after accident.—The Inspector must decide whether the use of the boiler can be permitted at the same or at a lower pressure without repairs or pending the completion of any repairs or alterations that he may order. In no case should he issue a provisional order or renewal certificate, until his orders have been carried out.

50. Procedure in case of serious accident.—The report should be sent without delay to the Chief Inspector; if he considers that the investigation has been sufficient, he will record the facts in his Register of Accidents and enter a brief account of the accident in the Registration Book, copy being made in the Memorandum of Inspection Book. If, however, the accident is of a serious nature and in all cases in which an explosion has occurred, the Chief Inspector should, after receipt of the Inspector's report, proceed to investigate the accident personally either alone or with the assistance of a member of the panel of assessors appointed under Rule 63 who may be appointed for this purpose by the Commissioner. Report of such inquiries should be recorded as indicated above.

51. Remuneration of Assessor.—The Assessor shall be remunerated at such rate as may be prescribed by the Government and be allowed the travelling expenses incurred by him in attending the inquiry.

52. Reference in annual report.—A brief account of all accidents and their causes should be included in the Chief Inspector's Annual report.

53. Unreported accidents.—If in the course of an inspection or at any other time, the Inspector discovers damage which comes within the definition of an accident, but which has not been reported, he should report the facts at once to the Chief Inspector for action under section 24(d).

VII. Appeals

54. Filing of appeal.—Every petition of appeal shall be made in writing either in English or in the vernacular.

55. Presentation of appeal.—An appeal may be presented either personally or by registered post to the Chief Inspector.

56. Form of appeal.—The petition of appeal shall be accompanied by the original order, notice or report appealed against or by a certified copy thereof or where no such order, notice or report has been made in writing, by a clear statement of the facts appealed against, the grounds of appeal and the referring section of the Act.

57. Fixing date for hearing.—On receipt of an appeal, the Chief Inspector, shall, if the appeal is to be heard by himself, at once fix a date for hearing the appeal; and if it is to be heard by the Appellate Authority, obtain a date for the hearing of the ap-

peal from the President of the Appellate Authority. It is important that there should be no delay in the decision of appeals, as the stoppage of a boiler is likely to put the owner thereof to great inconvenience. The decision should ordinarily be given within 10 days from the receipt of the petition of appeal.

58. Procedure before hearing. — When the date for hearing has been fixed, the Chief Inspector shall at once issue a notice to the appellant stating the date for hearing and informing him that if he wishes to be heard in support of the appeal or to produce evidence he must be present either in person or by authorised agent with his evidence on the date fixed. The notice shall be sent by registered post to such address as shall be entered in the petition of appeal.

59. Presence of Inspector. — In all appeals the Chief Inspector shall decide whether the presence of the Inspector is necessary, and shall issue orders accordingly.

60. Attendance of witnesses. — The Appellate Authority shall have power to secure the attendance of witnesses and to make local inquiries under the provisions of the Code of Civil Procedure, 1908.

61. Ex-parte decisions. — If the appellant is not present on the date fixed, the appeal may be decided in his absence.

62. Appellate Authority. — For the purpose of hearing appeals under section 20, there shall be an Appellate Authority consisting of the President and six assessors, appointed by the Government.

63. Qualifications of President and Assessors. — (1) A person to be appointed as the President of the Appellate Authority shall be one —

- (i) Who is holding or has held any judicial office not lower in rank than that of "Civil Judge" or "First Class Magistrate" or any office which in the opinion of the Government is an equivalent office;
- (ii) who is an advocate enrolled under the Advocate Act, 1961
- (iii) an attorney of a High Court.

(2) A person to be appointed as assessor shall be one who is a Mechanical Engineer possessing such qualifications as the Government may determine.

64. Constitution of Appellate Authority. — Whenever the date for an appeal before the Appellate Authority has been fixed, the Chief Inspector shall, under the orders of the President of the Appellate Authority arrange for the attendance of 3 members of the panel constituted under rule 62 to act as assessors.

65. Cost in Appeals. — In appeals before the Appellate Authority the President is authorised to fix the costs and recover them from the appellant in any case in which the appeal is dismissed; in all cases of appeal in which a local inspection is required by the appellant he shall deposit in advance the full costs of such inspection.

66. Fees required for certificates granted on appeal. — Any order on appeal authorising the registering of a boiler or the grant or renewal of a certificate shall be deemed to be subject to the pay-

ment of such fees as are prescribed by rules or regulations framed under the Act.

VIII. General

67. Boiler to be in-charge of person holding boiler attendant's or Engineer's certificate. — The owner of a boiler shall not use it or permit it to be used unless there is a fit and proper person in immediate attendance and charge as required by rule 68.

Provided that the Government (of Goa, Daman & Diu) may, by notification in the Official Gazette, exempt any boiler or classes or types of boiler from the operation of this rule:

Provided further that nothing in these rules shall debar a person from holding a certificate of competency, as an attendant or a certificate of proficiency as an Engineer granted under these rules from remaining in attendance and incharge of a boiler or boilers to the extent of his qualification indicated in such certificate.

68. Competent person must possess certificate — extent of qualification. — No person who does not possess a certificate of competency as an attendant or a certificate of proficiency as an Engineer under these rules shall be deemed a fit and proper person to hold charge of a boiler and no holder of any such certificate shall be deemed a fit and proper person to be in attendance and incharge of a boiler except to the extent of his qualification indicated in such certificate:

Provided that in respect of a boiler of any capacity worked by the military authority a person holding a certificate of competency as boiler attendant issued by a competent military authority shall, while he is in military employment and working under the sole control of the military authority, be deemed a fit and proper person to be in attendance and charge of the boiler.

69. Holders to produce the same certificate when called for by any authorised person. — The holder of a certificate under these rules, shall, at all reasonable times during the period any boiler is in his charge, be bound to produce such certificate when called upon to do so by any of the persons empowered under section 15 to call for the production of the certificate or provisional order authorising the use of the boiler.

70. Owner to furnish Chief Inspector with particulars of certificates. — (1) The owner of any boiler or battery of boilers who engages any person to be incharge thereof, shall within seven days of such engagement furnish the Chief Inspector with full particulars of such person including the grade, serial number, date and place of issue of his certificate.

(2) The owner of any boiler who engages any person to hold charge of such boiler shall, in the event of such person leaving his employment or in the event of the death of such person, report the fact forthwith to the Chief Inspector.

71. Limits of daily period of attendance, reliefs allowed and sphere of action. — (1) An attendant incharge of a boiler for which a certificate of competency as an attendant of the first class is required may be relieved of charge in any one day for not

more than two periods, the total of which does not exceed two hours by a person holding a certificate of the second class.

(2) The holder of a first class certificate may, with the consent in writing of the Chief Inspector, be relieved by a person holding a certificate of the second class for a period which may extend to seven consecutive days which, in special circumstances, the Chief Inspector may extend to any length of time not exceeding 30 days at a time.

(3) A person in charge of a boiler shall be deemed to be in direct and immediate attendance and charge of the same when he is within 46 metres of such boiler.

72. When boiler deemed to be in use. — (1) A boiler shall be deemed to be in use for the purpose of these rules when there is active fire in the furnace, firebox or fire-place for the purpose of heating the water in the boiler. A boiler shall be deemed to be not in use only when the fire is removed and all steam and water connections are closed.

(2) An economiser shall be deemed to be in use for the purpose of these rules, when there is a flow of flue gases past the economiser and an appreciable heat transfer between the water and the heating gases.

IX. Board

73. Constitution of the Board. — (1) A Board shall be constituted for the Union territory of Goa, Daman and Diu, consisting of the Chief Inspector, an Inspector nominated by the Chief Inspector and not less than two other members having theoretical and practical knowledge of prime movers and modern boiler practice to be appointed by the Government (of Goa, Daman and Diu) from time to time.

(2) The Chief Inspector shall be the ex-officio chairman and the Inspector nominated by the Chief Inspector shall be the ex-officio Secretary to the Board.

74. Terms of office of the members. — The term of office of each of the members other than the ex-officio members of the Board shall be three years. If a member dies, resigns, or is removed from the office or leaves the Union Territory of Goa, Daman and Diu or remains absent therefrom for a period of more than six months, he shall be deemed to have vacated his seat on the Board and another person may be appointed in his place for the unexpired portion of his term.

75. Function of Board. — The Board shall —

- (i) conduct examination of candidates for the grant of certificate of competency as a boiler attendant;

- (ii) grant certificates of competency as a boiler attendant;

- (iii) consider the reports of enquiries into allegations of drunkenness, negligence or misconduct on the part of Boiler Attendants holding certificates of competency granted under these rules and take such action as they may consider necessary.

76. Meeting of the Board. — The Board shall meet as often as may in the opinion of the Chairman be necessary for transacting business which cannot be disposed of by circulation of papers. At least fifteen

clear days' notice of a meeting shall be sent to each member.

77. Quorum. — The Chairman or the Secretary and two members of the Board shall form a quorum.

78. Chairman of the Board. — The Chairman shall preside over all meetings of the Board and in his absence, a member chosen by the members present at the meeting shall preside over the meeting.

79. Secretary of the Board. — The Secretary of the Board shall maintain a register of boiler attendants holding certificates of competency and shall perform such other functions as are specified in these Rules or as the Chairman of the Board may direct.

80. Board's endorsement on application. — The Board shall endorse on the printed application form of each candidate and the result of his examination for a certificate of competency as a Boiler Attendant. The endorsed application shall be returned to the Secretary to the Board.

81. Board empowered to refuse issue of certificate. — The Board shall have power to refuse the issue of certificate of competency as a Boiler Attendant to any candidate, who in the opinion of the majority of the members, appears too old or physically unfit through deformity, constitutional weakness, defective eyesight, deafness or loss of a limb to perform efficiently the duties of a Boiler Attendant.

The Board may require any candidate to produce a certificate of fitness from a registered medical practitioner. If the candidate produces such certificate of physical fitness the Board shall issue a certificate.

82. Fees for attending meetings. — Each non official member of the Board shall be entitled to a fee of sixty rupees for each meeting of the Board lasting more than three hours or a fee of thirty rupees for each meeting lasting less than three hours at which any duty prescribed in these rules in relation to certificates of competency as boiler attendants has been performed and which he has attended from the beginning to the end.

X. Examination

83. Examinations. — Examinations for the grant of certificates of competency as a Boiler Attendant to remain in-charge of boilers shall be held by the Board at Panaji-Goa and at such other places as the Government (of Goa, Daman and Diu) may from time to time determine and on such dates as may be notified by the Secretary of the Board from time to time in Official Gazette.

84. Kinds of examinations. — Examination for granting certificates of competency as a Boiler Attendant shall be of two kinds, viz. one for the award of first class certificate of competency as a Boiler Attendant and the other for the award of second class certificate of competency as Boiler Attendant.

85. Postponement of examination. — When a date fixed for the examination is declared a gazetted holiday or when for any unforeseen reason an exami-

nation cannot be held on the date fixed, the Chairman may fix some other day for holding the examination and the same shall be duly notified to the candidates for examination.

XI. Certificate of Competency

86. Classes of certificates and capabilities of holders thereof. — Except as otherwise provided in these rules, a certificate of competency granted thereunder shall be of two classes. The certificate of competency of First Class shall qualify the holder thereof to be incharge of either a single boiler or of two or more boilers in a battery, the total heating surface of which does not exceed 697 square metres. The certificate of the First Class shall also qualify the holder thereof to be incharge of so many separate individual boilers, the total heating surface of which does not exceed 697 square metres provided that such boilers are situated within a radius of 23 metres in the same premises and belong to the same owner and that the holder of the certificate of First Class is assisted by a Second Class Boiler Attendant, or such number of firemen as are considered necessary by the Chief Inspector of Boilers.

A certificate of Second Class shall qualify the holder thereof to be in charge of a single boiler of any kind, the heating surface of which does not exceed 139.5 square metres.

Provided that a Second Class Boiler Attendant may attend to a battery of Boilers (not consisting of more than three connected boilers and not exceeding 139.5 square metres in aggregate of total heating surface) if he is assisted by such number of firemen as are considered necessary by the Chief Inspector of Boilers.

87. Exchange certificate. — A person holding a certificate of competency as an Attendant or Engineer granted by a Board under the corresponding Rules in any other State of India shall, on application, have the certificate endorsed for validity in the Union Territory of Goa, Daman and Diu. Such endorsement shall be made by the Chairman of the Board constituted under these Rules.

88. Fees for examination. — (1) Candidates for examination for certificate of competency shall pay the following fees which shall not, except as otherwise provided in these rules, be returnable: —

Examination for First Class Certificate	Rs. 35.00
Examination for Second Class Certificate	Rs. 25.00
Duplicate Certificate	Rs. 10.00

(2) All fees for examination for certificate of competency as an Attendant leviable under these rules shall be paid in the Government Treasury in the Union Territory of Goa, Daman & Diu.

89. Refund of fees. — Candidates once admitted to an examination under these rules shall not be entitled to any refund of fees. Where a candidate is unavoidably absent from the Examination on the date fixed, the Chairman of the Board may allow him to appear without payment of the second fee at the next examination.

90. Fees of candidates found ineligible. — (1) A candidate who has paid the examination fee but is

found ineligible for an examination may, subject to the provisions of this rule, apply, within one year from the date of payment for a refund of the examination fee;

(2) In refunding the fee, the scrutiny fee of ten rupees shall be deducted, and the balance shall be refunded.

Provided that, the examination fee paid by a candidate who has been debarred under these rules, shall not be refunded.

XII. Application for Examination

91. Form of application. — Every application for examination shall be in Form D appended to these rules. The applicant shall fill in such parts of the Form as are to be filled in by a candidate and shall sign the Form in the presence of a Gazetted Officer or a Magistrate who shall attest his signature. The application so filled in shall be forwarded to the office of the Chairman of the Board not later than one month before the date fixed for the examination and shall be accompanied by —

(a) originals and one copy each of all testimonials of both practical and theoretical experience of the candidate;

(b) testimonials of good character from his employer;

(c) receipt from the Government Treasury in the Union territory of Goa, Daman and Diu in respect of the fee paid under sub-rule (2) of rule 88;

(d) any certificate granted to the applicant under these rules or a certificate granted by a competent authority referred to in rule 87;

(e) two copies of recent bust photographs (size 51 m.m.×57 m.m.) one of which shall bear the signature or the thumb-impression of the applicant on the back.

92. Candidate to produce satisfactory testimonials.

— No candidate shall be admitted to examination who cannot produce satisfactory testimonials certifying his experience, ability, sobriety and general good conduct for the whole period of his qualifying service. Any breaks in the period of qualifying service shall be accounted for.

93. Essential statements. — A testimonial shall clearly state the capacity in which the candidate was employed, whether as Boiler Attendant, Head Fireman, Donkeyman, or Fireman and the periods of such employment stating the dates between which the candidate was so employed.

94. Signature and Countersignature. — A testimonial shall be signed by a responsible person under whom the candidate was employed and be countersigned by the owner, agent, manager or Secretary of the mill, factory or workshop, as the case may be.

95. Service on steamship. — A testimonial in respect of service on a steamship may be signed by the Chief Engineer and countersigned by the master of the vessel or may be in the form of a seaman's discharge issued by a Shipping Master.

96. Railway or Public Works Department Service. — A testimonial of service of railway boilers, or boilers belonging to the Public Works Department

or local authorities shall be signed by a responsible officer under whom the candidate has directly served and countersigned by the head of the department concerned.

97. Doubtful testimonials. — If the Secretary to the Board has reason to doubt the truth of any statement made in application or testimonials, he may make such inquiries as he thinks fit to verify the same.

98. False testimonials. — If on inquiry the Secretary is satisfied that any testimonial submitted by a candidate is false in any material particular, he shall submit his findings to the Chairman of the Board who may by a written order debar such candidate from being admitted to any subsequent examination held under these rules for such period as may be prescribed in the said order. If, on the strength of any such testimonials, a candidate has already been admitted to an examination he shall be deemed to have failed in such examination and any certificate granted to him as a result of his having been declared to have passed such examination, shall be forthwith recalled and be cancelled by a notification in the Official Gazette provided that before any certificate is cancelled under this rule, the holder thereof shall be given a reasonable opportunity of being heard in the matter.

99. Debarred candidates, applying for admission to examination during prohibited period. — If the Secretary discovers that a candidate who has been debarred from being admitted to an examination for a specific period, either under these rules or under the corresponding rules in any other State in India, has applied during the prohibited period for securing admission to an examination, he shall submit his findings to the chairman to the Board who may, after giving an opportunity to the candidate to be heard, by a written order, debar such candidate permanently from being admitted to any subsequent examination held under these rules. The candidate who has already been admitted to an examination he shall be deemed to have failed in the examination and any certificate granted to him as a result of having been declared to have passed such examination shall be forthwith recalled and be cancelled by a notification in the Official Gazette.

100. Filing of copies and return of original testimonials. — Applications and copies of testimonials submitted by the candidates shall be filed in the office of the Chairman of the Board. Original testimonials shall be returned to the candidates after the close of the examination.

XIII. Age and Training

101. Age and training of second class candidates. — A candidate for a certificate of competency as a Boiler Attendant of the second class shall not be less than 20 years of age and shall not be admitted to the examination unless he proves to the satisfaction of the Board that he —

(a) has served for not less than three years in the capacity of a fireman or an assistant fireman on a steam-boiler or a combined steam engine and a boiler; or

(b) has served for not less than three years

as an engine fitter where boilers and engines are repaired or made and worked under steam, the one year at least of which he should have worked as an Assistant Fireman; or

(c) produces from the head of an industrial or technical institution a certificate stating that he has completed a three years' course of training, one year of which must have been as an apprentice in a steam power plant of a mill or factory or an engineering workshop for the maintenance of boilers.

102. Age and training of first class candidates. — A candidate for a certificate of competency as a Boiler Attendant of the first class shall not be less than twenty-one year of age and shall not be admitted to the examination unless he possesses a certificate of the second class and in addition thereto —

(a) has served for not less than two years as boiler attendant with second class certificate of competency or its equivalent in sole working charge of a boiler whose rated heating surface is not less than 46.5 square metres; or

(b) produces from the head of an industrial or technical institution a certificate, stating that he has completed a three years' course of training, one year of which must have been as an apprentice in a steam power plant of a mill or factory or an engineering workshop where engines and boilers are repaired or made and in addition has served for not less than one year in sole working charge of a boiler of not less than 46.5 square metres of heating surface with a second class Boiler Attendant's Certificate or its equivalent.

103. Services not in strict conformity with rules. — Notwithstanding anything to the contrary contained in rules 101 and 102 the Government (of Goa, Daman and Diu) may empower the Chairman of the Board to admit in his discretion any candidate to an examination under these Rules, if he so thinks fit.

104. Restriction on admission of foreigners to examination. — Notwithstanding anything contained in the foreign rules, no candidate who is not a citizen of India, shall be admitted to any examination without the permission in writing of the Civil Authority appointed under the Foreigners Order, 1948.

XIV. Examination Subjects

105. Second class boiler attendants. — A candidate in order to be qualified for a certificate of competency of the second class, shall inter alia satisfy the examiners that —

(a) he clearly understands —

(i) the working and management of a steam boiler and economiser;

(ii) the use and purpose of the various valves, cocks mountings and fittings;

(iii) the precautions to be taken and procedure to be observed before starting fires and when raising steam;

(iv) the use of a feed pump and injector;

(v) the reading of the pressure gauge;

(vi) the need for periodical cleaning and pure water-supply and for prevention of scale or other deposits on heating surfaces;

(vii) the need for periodical inspection of boilers and the manner in which they should be

prepared for thorough inspection, hydraulic test and steam test;

(viii) the precautions to be taken before entering or allowing any person to enter a boiler that is connected to another boiler under steam;

(ix) the use of the best means of firing for the prevention of smoke;

(xi) the danger of water lodging in steam pipes and the precautions to be observed in draining;

(xii) the procedure to be followed in the event of shortage of water, bulging or fracture of furnaces or flat plates or bursting of tubes or of any accidents to a boiler or steam pipe;

(xiii) precautions to be taken when starting an economiser to work after a period of rest;

(xiv) procedure to be adopted in bringing an economiser into commission and also to putting it out of commission while the boiler is on steam; and that

(b) he is able *inter alia* —

(i) to stoke a boiler including cleaning and banking fires in a workmanlike manner;

(ii) to show how avoidable smoke may be prevented;

(iii) to blow through and test the correctness of water-gauge glasses and test cocks;

(iv) to replace a gauge glass and show how a false water level glass might be shown;

(v) to ease a safety valve and use a blow down cock or valve;

(vi) to adjust a high steam and low water safety valve and renew a fusible plug;

(vii) to pack pump or valve chest glands;

(viii) to grind and adjust cocks and valves;

(ix) to take a feed pump or injector to pieces and replace in working order;

(x) to handle the appliances provided for keeping the economisers clean.

106. First class boiler attendants. — A candidate in order to be qualified for a certificate of competency of the first class, shall satisfy the examiners that in addition to the subjects specified for candidates for certificate of competency of the second class, he has at least a rudimentary knowledge of the principal elementary facts relating to combustion, heat and steam; and that he is able to explain *inter alia* —

(i) the principle causes and effects of corrosion and incrustation and the usual remedies employed;

(ii) the object of the use of water softners;

(iii) the principles on which feed pumps and injectors work;

(iv) the principles on which appliances for the prevention of smoke work;

(v) the purpose of super-heaters, economisers, feed heaters, feed filters, forced and induced drafts appliances and mechanical stokers.

XV. Mode of Examination

107. Examination in writing optional. — The examination shall be conducted orally, but any candidate may, if he desires, write his answers to such written questions as may be given to him by the examiners.

108. Examination where held. — If the Board consider necessary the examination may be held either in a factory or mill or in a workshop in which boilers are used or partly in such factory, mill or workshop and partly in the examination room where models and sketches of boilers may be kept for *viva voce test*.

109. Hours of Examination. — Examination shall be conducted in the examination room between the hours of 11 a.m. and 5 p.m. unless otherwise notified by the Chairman and elsewhere, at such time as the examiner may fix.

XVI. Grant of Certificate

110. Grant of certificate of competency. — If a candidate passes the examination the result will be notified in the Official Gazette and he shall be granted a certificate in accordance with the class in which he passed as soon as practicable after the close of the examination.

111. Form of certificate. — Certificates of competency of first class and second class as a Boiler Attendant under rule 86 shall be in Forms E and F, respectively, appended to these rules.

112. Surrender of lower grade certificate. — No certificate of the first class shall be granted to the holder of a second class certificate after examination under these rules unless and until he has surrendered to the Chairman the certificate of the second class.

113. Application for exchange certificate. — An application for the endorsement of validity of a certificate of competency as a Boiler Attendant under Rule 87 shall be in Form D appended to these rules.

114. Record of duplicate certificate. — Duplicates of all certificates granted under these rules shall be recorded in the office of the Chairman.

115. Identification requirement. — Every certificate granted under these rules shall bear a bust photograph of the holder thereof previously submitted along with his application under rule 91 and his signature or thumb-impression and such other particulars as may be required for the purpose of identification.

116. Grant of duplicate certificate. — (1) Whenever the holder of a certificate proves to the satisfaction of the Chairman of the Board that the certificate granted to him under these rules has been lost, stolen or destroyed or mutilated without any fault on his part, he shall be granted a duplicate certificate to which by the record so kept as aforesaid, he appears to be entitled, which shall have for all purposes the same validity as the original certificate.

(2) If on the enquiry the Secretary to the Board is satisfied that any statement made by the applicant for the issue of a duplicate certificate is false, he shall report the case to the said Board at its next meeting and the Board may at its discretion cancel the certificate or permit the grant as aforesaid of a duplicate certificate either immediately or after such period not exceeding 12 months as the Board

may think fit having regard to the circumstances of each case.

117. Application for duplicate certificate. — Application for a duplicate certificate shall be lodged with the Chairman of the Board with a declaration sworn before a Gazetted Officer or a Magistrate stating that the certificate granted under these Rules has been lost without fault on the part of the applicant.

118. Invalidity of original certificate. — On the issue of a duplicate certificate, the original certificate shall cease to be valid, and shall if in the possession or power of the holder thereof be returned to the Office of the Chairman for cancellation.

119. Enquiry regarding certificate holders and suspension of certificate. — (1) If a District Magistrate or the Chief Inspector of Boilers has reason to believe from any cause whatsoever, that an enquiry should be made into an allegation of incompetency, drunkenness, misconduct or negligence on the part of an attendant holding certificate of competency under these rules, they shall either themselves make such enquiry or cause it to be made by their subordinate officers. The District Magistrate may depute a sub-Divisional Magistrate or a Magistrate of the First Class and the Chief Inspector and Inspector of Boilers duly authorised by him to hold such enquiry.

(2) The holder of such certificate shall on demand by the officer charged with the enquiry forthwith place in the hands of such officer his certificate to abide by the result of such enquiry.

(3) The proceedings shall be held in the presence of the person whose conduct forms the subject of enquiry and he shall have an opportunity of making any statement he may wish to make and of producing any evidence in his defence.

(4) The proceedings of any such enquiry shall be forwarded by the officer conducting the enquiry to the Secretary to the Board for consideration of the Board.

120. Submission of proceeding before the Board. — The Secretary to the Board shall submit the proceedings sent under sub-rule (4) of rule 119 before the Board at its next meeting and the Board at its discretion may allow the certificate to stand or may cancel the certificate permanently or suspend it for such period as it thinks fit.

XVII. Penalty

121. Cognizance of offences. — (1) The owner of a boiler who works or permits or causes the boiler to be worked at any time in contravention of rule 67 shall on conviction be punished with fine which may extend to one hundred rupees.

(2) Any person in charge of a boiler or any other person who works the same or permits or causes it to be worked in contravention of rules 68, 69, 70 and 71 shall on conviction be punished with fine which may extend to one hundred rupees.

XVIII. Engineers' Examination Rules

122. Examination where and when held. — Examination for persons desirous of obtaining

certificate of proficiency as engineers to be in charge of steam engine and boilers shall be held at such times and in such places as may be notified in the Official Gazette.

Provided that unless the Chief Inspector of Steam Boilers, Goa, Daman and Diu, shall, by notification in the Official Gazette, make an announcement to the contrary, they shall be held at Panaji by the Board at the same times and places as those prescribed for boiler attendants examination;

Provided also that such examinations shall be held at least once in any calendar year in Panaji if any candidate appearing to the Chief Inspector to be eligible applies for admission to him.

123. Fees to members. — Each member of the Board shall be entitled to a fee of seventy-five rupees for each meeting of the Board lasting more than three hours or a fee of thirty rupees for each meeting lasting less than three hours at which any duty prescribed in these rules in relation to certificates of proficiency as engineers has been performed and which he has attended from the beginning to the end.

124. Procedure for examination of engineers. — The same general procedure with regard to testimonials, applications and kindred matters prescribed under these rules for boiler attendants' examinations shall be observed for examinations of engineers and Form D appended to these rules shall, with such modifications as may be necessary, be used for the purpose of the said examinations.

125. Kinds of examination. — Examinations for engineers shall be of two kinds, one for first class certificates of proficiency and one for second class certificates of proficiency for which fees of Rs. 50/- and Rs. 40/- respectively, are prescribed.

126. Testimonials. — Candidates must produce satisfactory testimonials which must clearly state the kind of work on and the capacity in, which the candidate was employed, whether as apprentice engineer, assistant engineer or engineer and show the dates between which the candidate was so employed. Only service as an engineer, or engine fitter on steam machinery or as a mechanical and/or electrical engineering student will be considered by the Board for admission to examinations for certificates of proficiency.

Testimonials must be signed as in the case of applicants for certificates of competency as boiler attendants, that is, they must be signed by the responsible person under whom the candidate worked and be countersigned by the owner, agent or manager of the workshop or factory or person of corresponding status elsewhere.

Candidates who have undergone a course of training at an engineering college or technical institute must produce either the diploma of the institution or a certificate from the Principal or Superintendent of the institution for the time served.

XIX. Age and Training

127. Age and training of second class candidates. — A candidate for a certificate of proficiency of the second class must not be under 21 years of age and shall not be admitted to examination unless he

proves, to the satisfaction of the Board that he has served or undergone, for not less than five years, the service or training specified in clauses (a), (b) and (c) below, of which not less than three years must have been in accordance with clause (a) or clause (b); and not less than 2 years in accordance with clause (c) —

(a) as a full-time apprentice engineer or engine fitter in a suitable workshop manufacturing boilers and steam engines, auxiliaries machineries or maintenance, repairs and operation thereof; or must have served as Inspector of Boilers under Indian Boilers Act, 1923.

(b) has obtained a degree or diploma in mechanical, electrical engineering after completing a full-time course of training in an engineering college or technical institute recognised by the Government of Goa, Daman and Diu as suitable for training of mechanical or electrical engineers;

(c) as engineer or assistant engineer or assistant in engineering department in a factory as defined under clause (m) of section 2 of the Factories Act, 1948 or steamship, coupled with profound knowledge of boilers and their working.

128. Exemptions.— Candidates who have attended courses of instructions from such engineering colleges or technical institutes as are recognised by the Government of Goa, Daman and Diu and have obtained certificates showing that they have passed appropriate examination at the termination of the course will be granted exemption from appearing in the papers in Mathematics, General Engineering Science, Heat and Heat Engines and Drawing.

129. Unsuitable workshop.— No seasonal factory like cotton-ginning or pressing factory shall be recognised as a suitable workshop for the training of apprentice engineers or engine fitters.

130. Doubtful suitability.— In any case of doubt of the suitability of a workshop the Board may require a candidate to provide proof that the workshop in which he served was sufficiently equipped with machines and tools and that the work carried on was in manufacturing or repairing of steam engines or accessories.

131. Definition of apprentice service.— For the purpose of these rules service as an apprentice engineer means the regular performance of such duties in a workshop where steam plant or accessories are manufactured or repaired as will enable a person to obtain under efficient supervision, a practical knowledge of the various operations in the manufacturing or repairing of steam plant and to acquire practical experience in the use of tools in fabricating and fitting together of parts of machineries.

Although some practical knowledge of moulding, blacksmithing and drawing office work is highly desirable, not more than six months will be allowed for the time spent in either moulding or blacksmithing and not more than one year will be allowed for time spent in drawing office work in completing the total apprentice service.

132. Definition of engine fitters' service.— Service as engine fitter means service in manufacturing or accessories. Such service may include the service as a turner if employed on the same kind of work,

but not more than one-half of the qualifying period will be allowed for time spent as a turner in completing the total service.

133. Short Period of service.— No period of less than six months spent in any workshop or factory as apprentice engineer or fitter shall count as time qualifying for admission to examination.

134. Breaks in student's course.— A course of training begun at an engineering college or technical institute recognised by the Government of Goa, Daman and Diu may be continued and completed at any other approved college or institution but only complete and continuous annual courses will be allowed for completing the full course.

In such cases candidates must produce a certificate from each Principal or Superintendent of the institution concerned for the time spent under him.

135. Service as engineer.— Service as an engineer or assistant engineer or assistant in Engineering Department means service in those capacities only which afford opportunities of obtaining practical experience as an engineer on steam engines, boilers and steam plant generally in their working and maintenance. It does not include service as a fireman, boiler attendant, engine attendant or engine driver.

136. Age and training of first class candidates.— Subject to provisos below, a candidate for a certificate of proficiency of the first class must not be under twenty-three years of age and shall not be admitted to the examination unless he proves to the satisfaction of the Board that he possesses a certificate of the second class proficiency and in addition thereto has well versed in the working and repairs of boilers, after having obtained such certificate, for not less than one year.

(i) *Proviso to Direct Admission.*— Provided that any applicant who has fulfilled the training requirements prescribed in rule 127 for candidates for a certificate of the second class and in addition has served for not less than three years in the position prescribed in this rule, may be admitted to the examination for a certificate of the First Class, although he has not obtained a certificate of the lower grade.

(ii) *Proviso for Relaxation of Service Condition.*— Provided further that where an applicant does not fulfil the service conditions laid down in clause (c) of rule 127 or in this rule, the Board may, if it is satisfied that the applicant has served, in another position, for the minimum period laid down therein and obtained sufficient practical experience, in boiler working, maintenance and repairs relax such conditions and admit him to the examination.

137. Exemptions.— Candidates who have attended courses of instructions from such engineering colleges or technical institutes as are recognised by the Government and have obtained a certificate showing that they have passed appropriate examination at the termination of the course will be granted exemption from appearing in the papers in Mathematics, General Engineering Science, Heat and Heat Engines and Drawing.

XX. Examination Subjects

138. Subject for second class. — To satisfy the Board in examination and be entitled to a certificate of proficiency of the Second Class, a candidate must write a legible hand and show proficiency in the following subjects: —

(a) **Mathematics.** — Understand the use of Arithmetic to the extent of addition, roots, elementary geometry, simple equations, factorization and use of common logarithms, calculations of areas, volumes and weights of physical quantities and conversion from one system of unit to another, calculation of grate areas and heating surfaces.

(b) **General Engineering Science.** — Descriptions of stress, strain and elasticity, Hooke's Law, simple tension, compression and shear bending moment and shearing force, beams with concentrated and uniform loading. This cylindrical and spherical shells, strength of riveted joints, calculations of safe working pressure of boilers, shells and other parts of boilers, simple forces, power and solid friction, simple machines such as pulleys, wheel and axle, screw-jack, etc. Mechanical advantage, velocity ratio and efficiency. Uniform linear velocity and acceleration, basic knowledge of fluid pressure and flow through pipes.

(c) **Heat and heat engines.** — (i) Temperature scales and their conversion, linear and volumetric expansion or contraction due to change of temperature. Coefficient of expansion. Specific heat. Resulting temperature of mixtures at different temperatures. Conduction, convection and radiation of heat, Boyle's Law and Charles' Law and the Gas Equation.

(ii) Properties of steam, sensible heat, latent heat, superheat and total heat of steam, dryness fraction, specific volume, use of steam tables.

(iii) Calculation of work done with hypothetical pressure column diagrams with constant steam pressure and with expansion according to the law $pv = a$ constant.

(iv) Energy, methods of measurements of energy and work, mechanical equivalent of heat. Fuels, and generation of heat by combustion, calorific value of fuels.

(v) Elementary principles and cycles of operation of steam and internal combustion engines, air-compressors, condensers, evaporators and pumps.

(d) **Engineering Knowledge.** — (i) The general effects of the various treatments on the physical properties of materials commonly used in the construction of engines and boilers and the mechanical tests to which these materials are normally subjected.

(ii) Heat and combustion. The properties of steam, fuel, lubricants and other liquids, gases and vapours used in machinery and boilers.

(iii) The use of pressure gauge, voltmeter, ammeter, thermometer and pyrometer, barometer, salinometer and hydrometer and other meters commonly used and constructional details and principles involved therein.

(iv) The causes, effects and usual remedies for incrustation and corrosion. Feed water conditioning and blow densities and scales formation.

(v) Constructional details and working principles of engines, methods of determining their H.P.

(vi) The layout and working of electric light and power circuits. The elementary principles of electricity.

(vii) Application and use of the Indicator. Calculation of mean pressure and horse-power. Fluctuation of pressure in the cylinder as shown by indicator diagrams.

(viii) The methods of dealing with wear and tear of machineries and boilers. The alignment of machinery parts. The correction of defects due to flaws in material, or accident temporary or permanent repairs in the event of derangement or total breakdown.

(ix) Constructional details, principles, action of centrifugal bucket, and force pumps. The general requirements concerning feed and fuel pumping systems.

(x) The constructional arrangement, details and working of hydraulic machineries and such steam and internal combustion engines as are used for emergency and auxiliary machineries.

(xi) Precautions against fire or explosions due to oil or gas. Flash point. Explosive properties of gas or vapour given off by fuel or lubricating oil when mixed with a quantity of air. The danger or leakage from oil tanks, pipes, gas producers, vaporisers and other unventilated spaces.

(xii) Spontaneous combustion of coal. Explosive properties of gas given off by coal — Ventilation and storage of coal.

(xiii) Fire detection, methods of dealing with fire. Action and maintenance of mechanical and chemical fire extinguishers and other firefighting appliances, respirators and safety lamps.

(xiv) The methods of construction of steam engines and boilers, the process to which the several parts are subjected or which are incidental to the manufacture and the methods employed in fitting the machinery.

(xv) The methods of testing and altering the setting of the steam admission and exhaust valves and the effects produced in the working of the engines by definite alterations in the setting of the valves.

(xvi) The constructional details and working of evaporators' feed heaters and feed water filters.

(xvii) The boilers of various modern designs, riveted and welded tubes. The determination by calculation of safe working pressure for boilers of given dimensions.

(xviii) Types of superheaters and Economisers, their functions, and advantages and safety precautions during their operations.

(xix) The use and management of boilers, superheaters and economisers, fittings and mountings with special preference to water gauges and safety valves. Precautions necessary when raising steam and operating stop valves, with particular reference to the danger arising from water hammer action and overheating of the tubes.

(xx) Constructional details, operation and maintenance of installations generally employed for assisting draught, superheating steam and burning coal or oil fuel.

(xxi) The principles underlying the working of internal combustion engines, the difference between various types of engines.

(xxii) The nature and properties of the fuel and lubricating oils generally used in internal combustion engines. The supply of air and fuels to cylinders of engines of different types. The constructional details of apparatus for carburetors or atomising the fuel. The means of cooling the cylinders and pistons.

(xxiii) The methods of constructing internal combustion engines. The processes to which the several parts are subjected or which are incidental to the manufacture and the methods employed in fitting the machinery. Starting arrangements and the various operations connected therewith.

(xxiv) The attention required for the operations and maintenance of the various parts of machineries. The use and management of valves, pipes, connections and safety devices employed.

(e) *Drawing Paper.*—Working drawing in elevation, plan and section of bolts, nuts, riveted joints, keys, flange couplings, boiler and engine parts such as gusset and bridge stays, piston, stuffing box, cross-hand, connecting rod, bearings, etc.

(f) *Oral Examination.*—The oral examination will be largely based upon the practical knowledge of the subjects of the examination and will incorporate questions on the management of boilers, engines and other machineries, the duties as an engineer or assistant engineer. The overhauling of the steam plant and other machineries and periodical examination of the working parts.

The candidates should also be well acquainted with the accidents to steam plant and other machineries and be able to state how these can be prevented and remedied.

139. Subjects for first class.—To satisfy the Board in examination and be entitled to a certificate of proficiency of the first class, all candidates, whether in possession of or about to claim a certificate of the second class or not, must be able to satisfy the requirements prescribed under the preceding rule of second class candidates.

In addition to the subjects shown in rule 138, the candidate must show proficiency in the following subjects:—

a) *Mathematics.*—Use of quadratic and simultaneous equations, graphical work, properties of triangles and circles. Elementary trigonometry, calculations of areas by Simpson's first rule.

b) *General Engineering Science.*—Module of elasticities, strain, energy, stress due to sudden loading, moment of inertia and strength of beams. Torsion and power transmission. Helical springs and closed coil. Transmission of power by gearing. Centrifugal force, its incidence in machine parts including the rims of flywheels, Kinetic energy of rotating bodies and governors. Newton's laws of motion, momentum inclined plane, angular velo-

city and acceleration, relative velocity, vectors, fluids, friction and flow through orifices and nozzles.

(c) *Heat and Heat Engines.*—(i) Adiabatic expansion and compression: $pv = \text{a constant}$. Relation and economic use of fuel.

(ii) Heat balance with reference to engine and boiler trials. Air required for combustion and economic use of fuel.

(iii) Carnot cycle. Elementary dynamics of the reciprocating steam engines, valve diagrams of steam engines. Principles of steam turbines.

(d) *Engineering Knowledge.*—(i) The principles of working and methods of calibration of dynamometers and torsion-meters.

(ii) The constructional arrangement, details and working principles of space heating and ventilation.

(iii) The working principles of different types of water-softening and demineralizing plants. Analysis of feed water, defects due to untreated feed water and remedies.

(iv) The principles of welding technique, metallurgy, radiography and other methods of destructive and non-destructive testing of pressure vessels and welded specimens. Heat treatment of welded and repaired pressure vessels and boiler parts.

(v) The construction details of internal combustion engines and air compressors in general use.

(vi) The maintenance and working condition of machineries and appliances placed in charge of an Engineer. The attention required to prevent breakdown and defects. The usual repairs and renewals required, supervision and inspection of machinery and boilers.

Preparation of boilers for inspection.

(vii) The recognition of irregularity in the running of engines from indicator diagrams. The rectification of these irregularities. Illustration by means of sketches of the charge produced in the diagram due to an alteration in the setting or working of the valves or any other factors.

(viii) Descriptions and principles of mechanical stockers, pulverised fuel and fuel oil system.

(ix) Boiler rating, evaporative capacity, equivalent evaporation and efficiency.

(x) Combustion, Orsat's apparatus, Carbon-dioxide recorders and prevention of smoke.

(xi) Surface and jet condensers, ejectors and air pumps and other auxiliaries.

(e) *Drawing Paper.*—Working drawing of boiler and engine parts and boiler mountings, fittings and auxiliaries.

(f) *Oral Examination.*—The oral examination will be largely based upon the practical knowledge of the subjects of the examination and will incorporate questions on the management of boilers, engines and other machineries. The duties of an engineer or assistant engineer. The overhauling of steam and other machineries and periodical examination of the working parts.

The candidate should also be well acquainted with accidents to steam plants, other machineries and boilers and be able to state how these can be prevented and remedied.

140. Nature of examination.— Examinations for certificate of proficiency as engineers to be in charge of steam engines and boilers shall be of such a nature as to test the practical and technical knowledge of the candidates and to ascertain their fitness to take charge of steam plant and machineries.

141. Order of subjects for second class examination.— Examination for second class certificate shall be conducted in the following order and stages:

(a) to write answers within a prescribed time to six questions in each of the subjects prescribed in rule 138, that is to say—

(1) Mathematics, (2) General Engineering Science, (3) Heat and Heat Engines, (4) Engineering Knowledge and (5) Drawing paper;

(b) to answer orally questions on each of the subjects referred to in clause (a), make a sketch and read the working drawing and if required by the examiner to undergo a practical test in the said subjects.

142. Assessment of work.— The percentage of marks to be secured in each of the five subjects referred to in clause (a) of rule 141 shall not be less than 50 per cent and for oral questions on each of the subjects aforesaid shall not be less than 75 per cent.

The aggregate percentage of marks thus obtained shall not be less than 60 per cent, otherwise the candidate shall be declared to have failed.

143. Orders of subjects for first class examination.— Examination for first class certificates shall be conducted in the following order and stages:—

(a) to write answers within a prescribed time to six questions in each of the subjects prescribed in rule 139, that is to say—

(1) Mathematics, (2) General Engineering Science, (3) Heat and Heat Engines, (4) Engineering Knowledge and (5) Drawing paper;

(b) to answer orally questions on each of the subjects referred to in clause (a), make a sketch and read the working drawing and if required by the examiners to undergo a practical test in the said subjects.

144. Assessment of work.— The percentage of marks to be secured in each of the five subjects referred to in clause (a) of rule 143 shall not be less than 50 per cent, and for oral questions on each of the subjects aforesaid shall not be less than 75 per cent.

The aggregate percentage of marks thus obtained shall not be less than 60 per cent, otherwise the candidate shall be declared to have failed.

145. Rules for examination room.— Candidates for certificates of proficiency will be allowed in the time allotted to cancel any part of their work, and when required, additional paper will be supplied by the examiner, but they will not be allowed to work out the problems on a slate or on waste paper. The additional sheets shall be attached to and form part of the examination paper to be given in by the candidate.

Written answers and drawings shall be made out in the presence of the examiner and shall be submitted, whether complete or not, on the expiration of the prescribed time.

Drawing boards, T-squares and drawing papers will be provided at the examinations but candidates will have to bring their own drawing instruments.

If a candidate leaves the room before answering any question or before completing any paper which has been given to him, he cannot afterwards be permitted to answer or complete the paper, as the case may be.

Any candidate found to have taken into the examination room any book, paper, document or memorandum of any description or to have copied from or given assistance or received any assistance or any information to or from or communicating in any way with another candidate during the time of examination shall be regarded as having failed in his examination and shall not be allowed to proceed further with the examination.

146. Time-table of examination.— Examination for first and second class engineers shall be timed as follows unless otherwise notified by the Chief Inspector who shall also prescribe intervals if necessary:—

FIRST CLASS

Day	Morning Session 10.00 a. m. to 1.00 p. m.	Afternoon Session 2.00 p. m. to 5.00 p. m.
(1)	(2)	(3)
First day	Engineering Knowledge I	Mathematics
Second day	Engineering Knowledge II	Heat and Heat Engines
Third day	General Engineering Science	—
Fourth day	Drawing paper	Oral to 3.00 p. m.
Fifth day & subsequent days	Oral	Oral

SECOND CLASS

Day	Morning Session 10.00 a. m. to 1.00 p. m.	Afternoon Session 2.00 p. m. to 5.00 p. m.
(1)	(2)	(3)
First day	Engineering Knowledge I	Mathematics
Second day	Engineering Knowledge II	Heat and Heat Engines
Third day	General Engineering Science	Drawing paper
Fourth day and subsequent days	Oral	Oral

Note:— First Engineering Knowledge paper will pertain to operation and maintenance of boilers and other machinery. Second Engineering knowledge paper will cover more or less theoretical portion.

The examination may be continued from day to day, until all the candidates have been dealt with:

Provided that if a candidate finishes his drawing examination before the time prescribed for its completion, the examiners may forthwith begin or

continue, as the case may be, the oral examination of the candidate and proceed with it till 5.00 p.m. on that day and continue or complete it on any subsequent day of the examination.

147. Grant of certificate of proficiency. — If a candidate passes the examination he shall be granted a certificate in accordance with the class in which he passed at such early date within two weeks after the completion of the examination as is practicable.

148. Form of certificate of proficiency. — Certificate of proficiency as engineers to be in charge of steam engines and boilers shall be in Form G appended to these rules.

149. Record of certificate of proficiency. — Counterfoils of all certificates granted under these rules shall be recorded in the office of the Chief Inspector.

150. Repeal and savings. — The Goa Boilers Rules, 1964 as in force in the whole of Territory of Goa are hereby repealed.

Provided that the provisions of section 6 of the General Clauses Act, 1—97(X of 1897), shall be applicable as regards such appeal;

Provided further that anything done or any action taken under such repealed rules shall be deemed to have been done or taken under the corresponding provision of these rules.

APPENDIX

FORM 'A'

Boiler Inspection

Register of Boilers

(Rules 9, 17 & 21)

Registry No.	Type of Boiler	Boiler rating	Name of manufacturer	Year and place of construction	Date of registration	Name of Owner	Place where in use	(Transfers Remarks etc.)
1	2	3	4	5	6	7	8	9

In part II of the Register, Column (1) should contain registry numbers and letters.

FORM 'B'

Indian Boilers Act, 1923 (Act V of 1923)

Notice for Examination of Boiler under sections 7 and 8

(Rule 33)

No.

of 19 ...

STEAM BOILER INSPECTION OFFICE:

Dated the 19 ...

To

.....
.....
.....

Gentlemen/Sir,

In reply to your application, dated you are hereby informed that Boiler Registry No. at the above named premises will be thoroughly examined by the

hydraulically tested

Government Inspector on the

To enable the examination to be made, you are bound —

(a) to afford to the Inspector all reasonable facilities for the examination and all such information as may reasonably be required of you;

(b) to have the boiler properly prepared and ready for examination in the prescribed manner; and

(c) in the case of an application for the registration of a boiler, to provide such drawings, specifications, certificates and other particulars as may be prescribed.

Voucher No. in acknowledgement of
Bank Receipt No. for Rs. accompanies.

Treasury

Chief Inspector of Steam Boiler
Goa, Daman & Diu.

(See reverse for preparation required)

(Reverse of Form B)

Preparation for Examination

See Chapter IX of the Regulations

(Regulation 376)

(a) Preparation for Inspection.

At every examination of a boiler for the grant or renewal of a certificate, the boiler shall be empty and thoroughly clean in all its parts. All doors of manholes, handholes and sightholes and cleaning plugs and all caps in the headers and mud-drums of water tube boilers, all firebars, bearers, front plates, bridge plates, firebridges, brick arches, oil fuel burners and mechanical stoker fittings shall be removed. All valves and cocks comprising the boiler mounting shall be opened up and taken apart and the valves or cocks ground, when necessary, before the Inspector's visit.

Provision shall, if required by the Inspector, be made for the removal of lagging or brickwork or other concealing part and for the drilling of plates and for verifying the pressure gauge and safety valve dimensions and weights. All smoke tubes, exterior of water tubes, smoke-boxes, and external flues shall be swept clean.

Provision shall be made for the effective disconnection of all steam and hot water communication with any other boiler under steam, as prescribed in Chapter X of the Regulations. This shall be effected either by the removal of a length of pipe from the steam and feed piping or by the insertion of substantial blank flanges. Where blank flanges are employed, they shall be inserted between the flange of the chest and the pipe attached to it. No blank flange shall be inserted between a safety valve chest and the boiler.

In the case of forced flow and forced circulation types of boilers, provision shall be made for checking that proper circulation is maintained through all sections of the circuit by the flow of water.

Note: — These provisions as to effective disconnection shall extend to every case wherein a person is sent or with the assent of the owner or person in-charge goes into boiler for any purpose (See Part III of Regulation).

(Regulation 378)

(b) Preparation for Hydraulic Test.

The chest of all mountings subject to steam pressure shall be in place and shut tight or blank-flanged. The safety valves shall either be jammed down or removed and the chest opening blank flanged. The attachment for the Inspector's test pump shall be in order. All doors shall be properly jointed and tightened up. The boiler shall be completely filled with water, care being taken to allow all air to escape and, if possible, a preliminary test not exceeding the working pressure of the boiler be taken before the Inspector's visit to test the rightness of the joints. When a boiler is hydraulically tested for the first time, it shall be entirely cleared of lagging or brickwork; at subsequent tests the lagging or brickwork or portions thereof, shall be removed if required by the Inspector.

Preparation now required. (A), (B).

Note: — The last certificate for the boiler should be shown to the Inspector.

FORM 'C'

General Working of Boiler

(See rule 8)

Instructions to Boiler Attendants

These instructions should be frequently and carefully studied, with a view to keeping in mind the precautions to be observed and the ordinary procedure to be followed in the safe working of boilers.

Precautions before starting the Fires

Before starting the fires in a boiler, the attendant should—

- (1) see that there is sufficient water in the boiler, and that the gauge cocks are working freely;
- (2) ease safety valves, or open cock on top of boiler to allow air to escape;
- (3) see that the blow-off cock is fully closed and tight;
- (4) see that the safety valves and feed check valve are free and workable;
- (5) note if the pressure gauge pointer is at zero;
- (6) see that the feed pump is in working order.

He must not rely on the supposition that the water he has previously put in it still in the boiler, as it may have run out without his knowledge through a leak or open cock, nor can he be sure that the gauge glass shows the true water level until he has tested it. This is done in the following manner; shut off the lower gauge cock and empty the glass by the drain cock; then shut the drain cock and open the gauge cock; if everything is in order, the water will then rise in the glass to the same height as before.

Raising steam. — In getting up steam in all types of boilers the operation should be as gradual as circumstances will allow. Nothing turns a new boiler into an old one sooner than getting up steam too quickly. Forcing the fires when starting work is liable to cause straining of the streams and tubes of the boiler. In the case of large boilers generally steam should not be got up in less than six hours. Before getting up steam, the water level should be observed, to ensure that water is at the proper heights in the glass, the pressure gauge noted and the safety valves tried to see they are free. The blow-off cock should be examined to see that it is completely shut and tight.

Pressure gauge. — The pressure or steam gauge should be kept in order and be in such a position as to be easily seen by the boiler attendant. There should be a plain mark on it showing the highest pressure allowed for the boiler, and the dial should be kept clean so that the figures may easily be read.

Steam pressure. — Ordinarily the safety valve will prevent the steam from rising much above the working pressure, but if the steam gauge shown is rapid an increase of pressure as to indicate danger of exceeding the highest limit, water

should be immediately fed into the boiler and the dampers partially closed in order to diminish the effect of the fire. If, however, the water has fallen so low that there is danger of an accident from this cause, the fires should be withdrawn before feeding in water, the safety valves eased, and if the engine is at rest it should be started so as to reduce the pressure.

The safety valves are provided to guard against over pressure.

They should be moved by hand every day so as to prevent them from sticking. If moved only occasionally, they are liable to leak.

The valve can be tested by slowly raising it a little, and when let down it should close perfectly tight. It should never be opened by a sudden knock or pull. If it does not close tight turn it on its seat until it fits, or when its construction does not permit this, raise it slowly a few times and let it down again, but on no account must the valve be screwed down further or loaded more than what has been allowed by the Inspector.

Safety valves must never be overloaded, and spring valves should have ferrules or other provisions against the valves being screwed down too far. In case of an accident resulting from wilful overloading the culprit might be held criminally responsible at the official inquiry or inquest.

Low water safety valves. — If there is low water safety valve, test it occasionally by lowering the water level to see that valve begins to blow at the right point. It should give warning «before» the water level has sunk too low and before damage can be done when the boiler is open, examine the floats and lever and see that they are free and that they give the valve the full rise. With the ordinary type of high steam and low water safety valve the float should be down at its lowest position and the valve full open when the boiler is empty.

The water gauge. — These will be kept in best order by frequently blowing through. The cocks are thus kept in good working condition without leaking. Blow through the drain cock at the bottom of the gauge, and shut and open the steam and water cocks every few hours. These cocks should be blown through more frequently when the water is dirty. Should either of the passage become choked, or whenever the water in the gauge glass moves sluggishly the passage must be cleaned. This is best done with a wire. The gauge glass is so arranged that its top cock connects with the steam space and its bottom cock is below the water line. The water line will ordinarily be near the middle of the glass tube. Always test the glass water gauges thoroughly the first thing in the morning and at the commencement of every shift. This is done by first opening drain cock and then shutting the upper cock which should give water; the upper cock should then be opened and the bottom cock closed which should give steam; during this test the drain cock should be kept open.

If water and steam do not appear in proper order the cocks are choked and the passages should be cleaned. To lessen the risk of breaking the gauge glass the water cock should always be reopened after the steam cock.

Gauge glasses with a narrow white stripe running the whole length of the glass on the side next the boiler are recommended as they show the water line more clearly especially when the water is dirty.

The boiler regulations framed by the Board require every water gauge glass to be fitted with a guard to prevent injury to the attendants. See that it is always in place, and clean when there is steam in the boiler.

Special Note. — It does not follow that there is plenty of water in the boiler because there is plenty of water in the gauge glass. The passages may be choked, and empty gauge glasses are sometimes mistaken for full ones, and explosions have resulted therefrom. Hence the importance of keeping the gauge cocks perfectly tight and clean and of blowing through the test cocks frequently.

A large number of accidents have due to inoperative water gauges, and to negligence of the attendant in not carefully reading the water level.

The Blow-off Cock. — The Blow-off should be used daily if the water is at all dirty or sedimentary, especially with Locomotive type and Vertical Boilers as their narrow water spaces are liable to get choked with mud, which soon hardens into a solid mass. The amount of water to be blown

depends on the size of the boiler and can be determined only from experience. When blowing out, the best result is obtained if the water has been at rest for some time (say before the engine is started) thus giving the sediment time to settle; if the feed water is clean merely turn the cock round.

The scum Cock. — When scum cocks are fitted, if the feed water is dirty, a little should be blown off daily; if the water is clean, merely turn the cock round. Before opening the scum cock, see that the water is at the height indicated by the water level pointer otherwise the scumming will be ineffective. Water should be blown from the surface through the scum cock when steam is being drawn off, i.e. when the engine or other machinery is working.

Manhole and other Door Joints.—When making such Joints and Jointing materials should never be of round sectioned packing. Care must be taken that the spigot of the door is centrally placed in the hole, as many accidents have resulted from packing being blown out between the spigot and side of hole, even when the clearance was only 3 mm. of an inch. The nuts must be carefully and evenly tightened. Further tightening should be made during the process of heating up the boiler when raising steam.

Steampipes.—When properly arranged should give no trouble. Frequently, however, they are so designed as to contain pockets, in which, while out of use, condensed steam accumulates. Such water is exceedingly dangerous and great care should be taken to see that the pipes are properly drained before the stop-valve is opened otherwise «water hammer» will take place even with the best designed steam pipes, and disastrous explosions, causing loss of life and property may occur.

Scale and Grease.—Roughly speaking, scale offers a hundred times as much resistance to the passage of heat as does a similar thickness of the steel or iron. A 12.7 mm. furnace plate covered with 2.5 mm. scale is as efficient a heat retarder as a steel furnace 254 mm. thick. Grease is about ten times worse than scale. In a boiler at work the temperature of a clean furnace plate is only slightly in excess of that of the water in the boiler; but if scale or grease is interposed between the water and the plate, the latter acquires temperature more nearly approximately that of the flame with which it is in contact. If the fire is fierce (artificial draught) the furnace tube may grow so hot that it elongates considerably. If in addition, cold air is admitted during each firing, aconcerting action of the furnace takes places, which is one of the worst causes of boiler wear and tear.

Wear and Tear.—Can be reduced and the life of a boiler prolonged if scale and grease are prevented from accumulating in a boiler. The combined effects of scale or grease and artificial draught are disastrous. Scale or grease also causes waste of fuel.

Grease.—A mixture of sedimentary water, soda, and grease produces an adhesive scum. Where this is suspected, the water level should never be lowered below the furnace top unless the boiler is afterwards entered and this scum cleaned off the furnace plate before the firing again.

Scale Removal.—The customary method is not a satisfactory one. The boiler is emptied and then cooled down by

opening all the manholes, and the result is that the scale which would otherwise be soft, hardens through contact with the air and requires laborious chipping opp.

A very effective, but slower method, is to retain the water in the boiler until cool, and not to run it out until the men are ready to enter the boiler with water hose brushes and scrapers. The scale will then be soft and easily removable.

If time is a consideration, the cooling can be accelerated by adding cold feed to the hot water in the boiler and slowly running off the cold water. Another method is to blow off the boiler with the lowest possible pressure (not more than 1.4 kgs. per sq. cm.) and to keep it closed until cold. The scale will then be easily removed.

Treatment of Feed water.— Many feed waters require soda or other chemicals to arrest corrosion or to change the nature of the scale.

There is no harmless chemical which will remove scale or sediment when it has once got into the boiler and the only effective process is to purify the feed water before it enters the boiler. By this means, the sediment, and generally, too the added chemicals, can be deposited in tanks or in filters, and therefore never goes into the boiler. Excepting when the water obtainable is very good water-purifying apparatus ought to pay any boiler owner, particularly at those works where three or more boilers are in constant work. Boiler owners wishing to have definite advice as to the best treatment of their feed water should have it analysed at some chemical laboratory and ascertain the best treatment in the particular circumstances.

Special attention is drawn to the not infrequent but very bad practice of allowing the waste stream from the Engine Cylinders or pumps to be drained into the boiler Feed Water Tanks. The waste steam from cylinders is always mixed with a certain amount of oily matter which will be deposited in the feed water tanks and ultimately be pumped into the boiler, with possibly disastrous results, as it will be obvious to every careful boiler attendant that should the oil be deposited on the furnace crowns, they may become overheated and collapse.

It should be the first care of the Boiler Owner, and the Boiler Attendant to see that the feed water is kept as pure as possible. Impure feed water means additional expense on the upkeep of the boiler.

Preservation of Boilers when not in use.—Steam boilers when not in use are liable to deterioration from corrosion and unless well cared for and made rust-proof, they may depreciate more rapidly than when in use. They should be thoroughly drained and thoroughly dried and all valves, cocks, and openings closed so as to exclude moisture. Another plan is to fill the boiler with water to which about 1/100 per cent caustic soda has been added.

Special Instructions for Boiler No. — This boiler should be opened up and thoroughly cleaned after a period of work which should not exceed A record of such cleanings should be maintained and produced, when required by the Inspector.

Dated:

Inspector of Boilers.

FORM 'D'

(See rules 93 and 113)

Indian Boilers Act, 1923 (V of 1923)

Application for Certificate of Competency as Boiler Attendant

Division I — Name, etc., of the Applicant

Name in full	Nationality	Date of birth	Place of birth	Permanent Address	Nature of certificate	Grade of certificate applied for	Whether appeared in any previous examination	If so, when and where
1	2	3	4	5	6	7	8	9

Division II—Particulars of all previous certificates (if any) issued in India

Number of certificate	Class of certificate	Where issued	Date of issue	If at any time suspended or cancelled, if so, state by whom	Date	Cause of suspension or cancellation
1	2	3	4	5	6	7

Division III — Declaration to be made by the applicant

I do hereby declare that the statements made in Divisions I, II and IV of this Form are correct and true to the best of my knowledge and belief; and the papers enumerated in Division IV and submitted with this Form are true and genuine documents and further that the copies of the document submitted with this Form are true and correct. I further declare that Statements made in Division IV contain a true and correct account of the whole period of my service without exception, and I make this declaration conscientiously believing the same to be true.

Dated at this day of 19 .

Signed in the presence —

Signature ...

Designation ...

Signature of the applicant ...
Present address ...

Notes. — (1) Every application must be accompanied by a treasury challan from the Union Territory of Goa, Daman and Diu, showing that the fee for the examination has been paid.

(2) Two copies of a recent bust photograph of the applicant (size 2" x 2 $\frac{1}{4}$ ") be accompanied with the application with applicants signature on the back thereof.

(3) Any person making false statement for the purpose of admission to the examination renders himself liable to prosecution.

(4) Incomplete applications are liable to be rejected.

Division IV — List of testimonials and statement of services

(The testimonials to be numbered consecutively according to the number given in column (1) below).

No. of tes- timonials (if any)	Date of each testi- monial	Name of person signing each tes- timonial	Address and desig- nation of factory or workshop where em- ployed	Number and type and heat- ing sur- face of boilers	Service of applicant					Initials of verifier to be filled by the Board	Remarks	
					Capacity in chich employed	Date of commencement	Date of termina- tion	Time employed in this service	Year	Month	Days	
1	2	3	4	5	6	7	8	9	10	11	12	13

Total Service —

Time served for which certificates are produced—

Time served for which no certificates are produced —

Division V — Certificate of Competency

Certified that Shri ... has been examined for a Certificate of Competency as Boiler Attendant of ... Class at this day of 19 , and has/has not satisfied us of his fitness to hold a certificate of competency as a Class Boiler Attendant. He has therefore passed/failed.

(4) Colour of hair -

(5) Colour of eyes —

(6) Personal marks or peculiarities —

Signature of Board of Examiners.

Issue of Certificate.

Personal description of applicant.

Certificate No. _____ of the Class Boiler Attendant issued
and the duplicate recorded.

- (1) Nationality —
(2) Height ft. inches.
(3) Complexion —

Secretary Board of Examiners.

FORM 'E'

Government of Goa, Daman and Diu

First Class Boiler Attendant Certificate of Competency

(Granted under rule 111 of the Goa, Daman and Diu Boiler Rules, 1973).

No.

of 19

Shri _____, aged about _____ years at present residing at _____ having satisfied the Board of Examiners appointed under the Goa, Daman and Diu Boiler Rules, 1973 of his competency to fulfil the duties of First Class Boiler Attendant is granted under the said rules this Certificate of Competency as a First Class Boiler Attendant authorising him to have charge of either a single boiler or of two or more boilers in a battery or of so many separate individual boilers the total heating surface of which in each case does not exceed 697 square metres provided that in the case of so many separate individual boilers the boilers shall be situated within a radius of 23 metres in the same premises and belong to the same owner and that he is assisted by a Second Class Boiler Attendant or * firemen.

Dated at this day of 19

Secretary to the Board of Examiners.

Chairman of the Board of Examiners.

Descriptive Roll ...



PHOTO

1. Date and place of birth ...
2. Address ...
3. Nationality ...
4. Height without shoes ...
5. Marks of identification ...
6. Left thumb impression ...
7. Signature ...

aggregate of total heating surface), provided he is assisted by *.

Dated at this day of 19.....

Secretary to the Board of Examiners.

Chairman of the Board of Examiners.

Descriptive Roll ...



PHOTO

* Here insert the number of firemen considered necessary by the Chief Inspector of Boilers.

FORM 'G'

Form of Certificate of Proficiency

(See Rule 148)

Certificate of proficiency of the First (or Second) Class

No. of 19

Shri _____, aged about _____ years at present residing at _____, having satisfied the Board of Examiners constituted under the Goa, Daman and Diu Boiler Rules, 1973 of his proficiency as an engineer to be in charge of steam engines and boilers is granted under the said rules this Certificate of proficiency of the First (or Second) Class.

Dated at this day of 19.....

Secretary to the Board of Examiners.

Chairman of the Board of Examiners.

Descriptive Roll ...

1. Date and place of birth ...
2. Address ...
3. Nationality ...
4. Height without shoes ...
5. Marks of identification ...
6. Signature ...

By order and in the name of the Lt. Governor of Goa, Daman and Diu.

J. C. Almeida, Secretary to Government, Labour and Information Department.

Panaji, 11th October, 1973.